How Can A Classification Key Be Used To Identify Organisms?

Subject: Life science, classification

Lesson Topic: Classification, Dichotomous Keys   Length: 1

Learner Objective:

After completing this investigation students will be able to;

1) *Identify* a set of pictured organisms by using a classification key with 100% accuracy
2) *Write* a dichotomous key for the identification of a set of pictured organisms, with 90% accuracy of content.

Introduction:

Future studies of invasive weed species will involve the need to understand dichotomous keys. These practice lessons, although not specific to alien weed species, provide students with a means to gain understanding of keys using plants and animals that are more familiar to them. Once the skill has been learned, it is easily transferable to the study of other plants and animals that may not be as familiar to students.

Content:

Suppose while walking through the woods you find a large colorful wildflower. Chances are the flower has already been named and classified, but how can you learn its identity? As an aid to help others identify unknown organisms, biologists have developed classification keys.

Many kinds of classification keys have been developed to identify wildflowers and many kinds of plants and animals. Though some of these keys may vary in purpose and complexity, they share certain features in common. These classification keys are often called *dichotomous keys*. The word dichotomous comes form the word dichotomy meaning "two opposing parts." A dichotomous key presents the user with two opposite statements about some trait of an organism. By choosing the statement that best describes the unknown organism, the user is led to further pairs of statements. By going from one set of statements to another, the name of the organism or its classification group is finally discovered.

Materials and Supplies:

Overhead of wildflowers
Overhead of frog anatomy
Overhead of frog species
Classification packet for each student (includes pictured organisms and worksheets)

Anticipatory Set:

Set out a collection of preserved frogs for the students to examine. Lead a discussion and list on the chalkboard on the descriptive characteristics they notice.

Activity Outline:

In this investigation students will use a simple classification key to identify several pictured organisms. Assist with the identification of frogs by using an overhead of the frogs while they examine their pictures (some features may be difficult to discern without giving assistance). They will then write a classification key for another group of pictured organisms. Provide the students with their classification packet and work as a group, with some direct instruction, through the worksheet.

Closure and Assessment:

Go over terms they have learned through this and previous classification labs. Make sure adequate time is allowed for completion of this worksheet so that it can be turned in for scoring at the end of class.

Independent Practice and Related Activities:

Extra credit "Questions for Thought" are provided at the end of the lesson.

Resources:

No other resources needed for this introductory lesson.

Vocabulary:

Dichotomous

National Science Education Standards:

Life Science - CONTENT STANDARD C:
As a result of their activities in grades 5-8, all students should develop understanding of
- ❑ Structure and function in living systems
- ❑ Reproduction and heredity
- ❑ Regulation and behavior
- ❑ Populations and ecosystems
- ❑ Diversity and adaptations of organisms

Name_____

Answer Sheet – Frog Classification

1. In what ways are the forelimbs and hindlimbs of a frog different?

2. Describe the dorsolateral ridges that are present in some frogs.

3. describe two ways in which the feet of frogs may be different.

Investigation
Part A
1. Write the name of each frog on the line that corresponds to its letter.

a) _____   h) _____

b) _____   i) _____

c) _____   j) _____

d) _____   k) _____

e) _____   l) _____
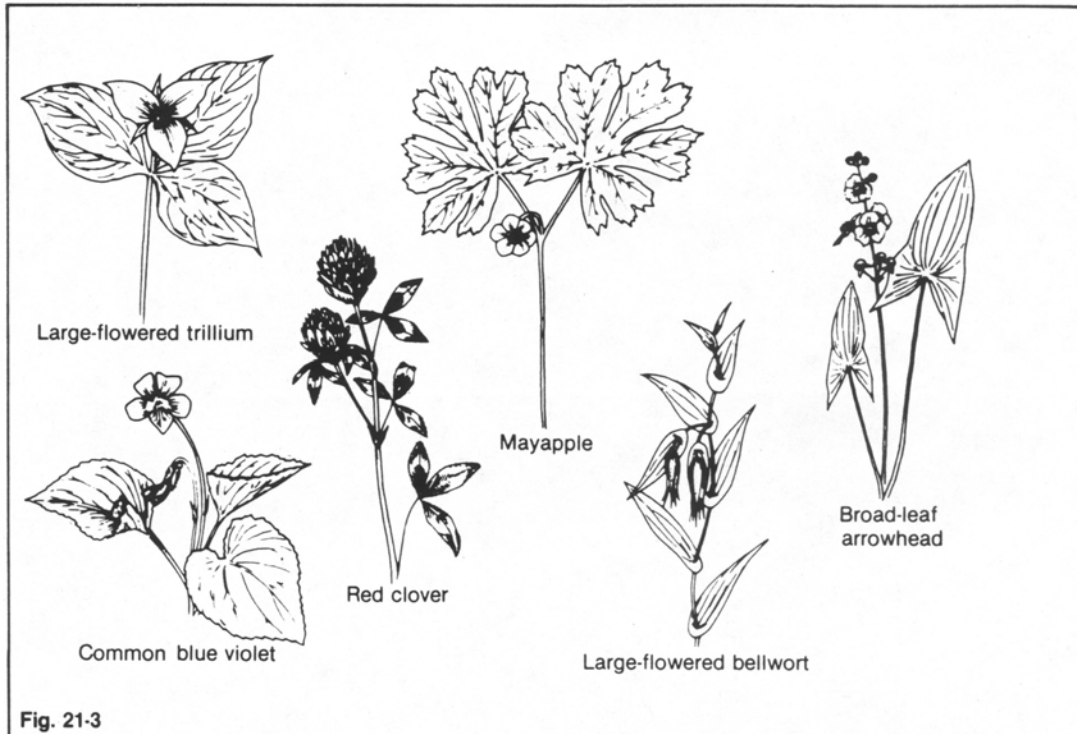
f) _____   m) _____

g) _____   n) _____

2. What are the advantages of using a classification key when identifying organisms?

3. What characteristics of frogs were most useful for keying them?

4. Do you think it would be easier to identify real frogs, rather than pictured frogs, by using a dichotomous key? Explain your answer.

Name _____

Part B

Wildflower Classification Key

1. Study the drawing of wildflowers, which show some common Northern wildflowers. As you study the pictured flowers, notice different characteristics such as flower shape, number of petals, and leaf number or shape. In the space provided below develop a classification key to identify each of the wildflowers.

Large-flowered trillium

Mayapple

Broad-leaf arrowhead

Common blue violet

Red clover

Large-flowered bellwort

Fig. 21-3

Write your key here:

Name _____

Part B cont.

1. Was your key exactly like that of other students? Why or why not?

2. If you were using actual wildflowers, what other characteristics could you use to identify them?

Extra Credit (5 pts. Each)

1. Do you think that there may be some closely related species of organisms that cannot be identified with a classification key? Explain your answer.

2. Why do you think biological classification keys always present two, rather than some other number of choices, at each step?